

Modern Data Analysis Methods for Wave and Oscillation Phenomena

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Abstract

Waves and oscillations in the Sun's atmosphere have been studied in great detail since the discovery of the 5-min oscillations in the early sixties. The recent discoveries of oscillations in coronal structures by SOHO and TRACE have opened new prospects for "coronal seismology". In many cases the characterization of the waves and oscillations is difficult because of a number of compounding factors. The waves usually have low amplitudes and thus low signal to noise in the observations, and their non-stationary behaviour in the dynamic, ever-changing atmosphere of the Sun adds to the complexity. Various methods have been developed to characterize and analyze waves and oscillations observed in the Sun's atmosphere. Most prominent among them are Fourier methods (power, phase, coherence spectra) and Wavelet techniques, which have become *en vogue* in recent years after their implementation in IDL by Torrence&Compo. Other techniques have been somewhat overlooked. In this talk we will review a number of analysis techniques and highlight both their strengths as well as shortcomings.